

producing with a laser source, an output having two superimposed orthogonally polarized beams having S and P polarization, with a frequency difference between them;

splitting the polarized beams into measurement and reference beams without altering the characteristics of the polarized beams;

causing the reference beams to interfere;

detecting with a reference photo detector the reference beams and providing a reference signal;

causing the measurement beam to strike the object of interest at an oblique angle after passing through a glass plate having a polarization coating on the bottom surface close to the object of interest, the oblique angle is such that the S polarization of the incident beam is reflected from the bottom surface of the polarization coated glass plate and the P polarization refracts through the glass plate, the P polarization reflects from the substantially non-transparent object of interest and refracts to the glass plate;

causing the reflected S and P polarization beams from the bottom surface of the glass plate and the surface of the object respectively to interfere;

detecting with a measurement photo detector the measurement beams and providing a measurement signal; and

determining the distance between the bottom surface of the glass plate and the object surface based on the phase difference between the measurement and reference signals from the measurement and reference photo detectors.